

CLAIMS

What is claimed is:

1. A plastics material processing system comprising:
 - a. a gravimetric blender for mixing predetermined weights of plastic resin material mixed components into a homogeneous blend;
 - b. a dryer receiving said blend and sequentially simultaneously cyclically heating and vacuum drying batch portions of said blend; and
 - c. a molding machine receiving and molding said dried blend into solid plastic products at the rate such material is received from said dryer.
2. A method for molding plastic into finished products comprising the steps of:
 - a. mixing predetermined weights of plastic resin material components into a homogeneous blend;
 - b. sequentially heating and vacuum drying batch portions of said blend with a next succeeding batch portion being heated while a current batch portion is vacuum dried; and
 - c. molding at least one plastic product from said current portion after vacuum drying.
3. The method of claim 2 further comprising performing step b to supply dried material at the rate of material consumption by step c.
4. The method of claim 2 wherein said molding step further comprises molding at least one plastic product from said current portion after vacuum drying while said next succeeding batch portion is being vacuum dried and a second succeeding batch is being heated.

5. Apparatus for drying granular or powdery material comprising:
- a. a tubular housing having inlet and outlet ends with material heating and drying zones positioned therebetween;
 - b. means for supplying granular or powdery material to be dried to said heating zone via said inlet end;
 - c. means for heating material in said heating zone of said housing;
 - d. means for selectably sealing material in said drying zone from said heating zone and permitting material travel from said heating zone to said drying zone;
 - e. means for drawing vacuum over material in said drying zone; and
 - f. means for evacuating dried material from said drying zone for molding or extrusion.

6. A method for drying granular or powdery material comprising:
- a. advancing a first portion of said granular or powdery material to be dried from a supply thereof into a heating zone within a tubular housing;
 - b. heating said first portion of material within said heating zone;
 - c. advancing said first portion of heated material from said heating zone into a vacuum drying zone of said housing;
 - d. advancing a second portion of heated material from said supply into said heating zone;
 - e. drawing a vacuum over said first portion of heated material in said vacuum drying zone to dry said first portion of material while heating said second portion of material in said heating zone;

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- f. advancing said first portion of material out of said drying zone for inventory or production into a finished product; and
 - g. repeating steps "a" through "f" successively for so long as dried material is required.
7. Apparatus for drying granular or powdery material prior to molding or extrusion, comprising:
- a. a first material processing chamber;
 - b. a second material processing chamber;
 - c. manifold means, connected to said first and second processing chambers, for selectably furnishing material to be dried to one of said first and second processing chambers;
 - d. means for heating material within said first and second processing chambers;
 - e. means for drawing vacuum over material in a selected one of said first and second processing chambers having had said material heated therein; and
 - f. means for evacuating material from a selected one of said chambers having dried material therein.
8. Apparatus of claim 7 wherein said manifold means furnishes material to a selected one of said first and second chambers most recently having had dried material evacuated therefrom.
9. Apparatus of claim 7 wherein said means for heating material in said processing chambers comprises separate means for heating material in said first and second processing chambers.

10. A method for drying granular or powdery material prior to molding or extrusion, comprising:

- a. feeding a first portion of material via a connecting manifold from a material supply to a first processing chamber;
- b. heating said material in said first processing chamber to a preselected temperature;
- c. drawing vacuum over said material in said first processing chamber;
- d. feeding a second portion of material via said connecting manifold from said material supply to a second processing chamber;
- e. heating said material in said second processing chamber while said first portion of material has vacuum drawn thereover;
- f. withdrawing material from said first processing chamber when needed for molding or extrusion;
- g. drawing vacuum over said heated material in said second processing chamber;
- h. withdrawing material from said second processing chamber when needed for molding or extrusion; and
- i. repeating steps (a) through (h) for so long as said molding or extrusion continues.

11. A low pressure dryer for granular or powdery material, comprising:

- a. a plurality of canisters rotatable about a common vertical axis serially among material heating, vacuum drying and inventory positions;
- b. means for rotating said canisters about said axis among said heating, vacuum drying and inventory positions;

- c. means for heating contents of a canister at said heating position;
- d. means for drawing vacuum within a canister at said vacuum drying position;
- and
- e. said canisters including axially movable valve means for selectably permitting downward flow of dried granular or powdery material out of a canister at said inventory position.
12. The dryer of claim 11 wherein said valve reciprocates.
13. The dryer of claim 12 wherein said valve moves along the axis of said canister.
14. The dryer of claim 13 wherein said valve moves in a range of motion having one extreme within said canister and a remaining extreme outside said canister.
15. The dryer of claim 12 wherein said valve moves responsively to motion of an axial rod within said canister.
16. The dryer of claim 12 further comprising a pneumatic piston cylinder means for actuating said valve.
17. A low pressure dryer for granular or powdery material comprising:
- a. a frame;
 - b. a cabinet supported by said frame and including an access door;
 - c. a plurality of canisters carried by said frame within said cabinet and movable among at least material heating and vacuum drying positions; and
 - d. means for sensing when said door is open and responsively thereto disabling said canisters from movement.
18. A low pressure dryer for granular or powdery material comprising:
- a. a frame;

- b. a plurality of canisters movably carried on said frame at least among material heating and vacuum drying positions;
- c. a material fill hopper supported by said frame;
- d. a valve supported by said frame for permitting downward flow of material from said fill hopper into a movable canister located below said fill hopper; and
- e. means for sensing presence of a canister below said fill hopper and disabling said valve from opening in the absence of a canister thereat.
19. A method for supplying dried granular resin material for processing from a supply of material which is excessively moist, comprising the simultaneously performed steps of:
- a. heating a portion of said moist material to a temperature at which moisture evaporates at a preselected vacuum;
- b. drawing at least said preselected vacuum over a second portion of said material which has been heated to said temperature for time sufficient to cause said moisture to evaporate therefrom and result in said second portion of material reaching a preselected dryness; and
- c. introducing hot air into said material having said preselected level of vacuum drawn therefrom to purge moist air from around such material while under said vacuum.
20. The method of claim 19 further comprising supplying to granular material processing equipment for molding or extrusion a third portion of said material which has been dried to said preselected dryness by evaporation in said preselected level of vacuum after being heated.

21. A canister for transporting granular plastic resin material in a resin material drying apparatus, comprising:

- a. a closeable cylindrical shell having an open lower end with a funneling wall within said shell converging towards said open end;
- b. an annular valve member having an open interior and being movable through said open lower end from a valve closed position at least partially within said shell to a valve open position at least partially outside said shell at which granular plastic resin material may flow downwardly out of said vessel through said open interior of said member;
- c. a frusto-conical hood within said shell for blocking entrance to said valve member open interior when said valve member is closed;
- d. an actuating rod coaxially positioned within said cylindrical vessel, fixedly connected to said valve member and slidably passing through said hood; and
- e. spring means for biasing said actuating rod in a direction away from said valve member to draw said annular valve member against said frusto-conical hood in said valve closed position.

22. The canister of claim 21 further comprising a tubular member surrounding said rod and being annularly spaced therefrom, connected to said frusto-conical hood at one end, having a perforate wall for introduction therethrough of heated air to the interior of said canister.

23. A plastics resin material dryer comprising:

- a. a rotatable carousel including vertically oriented vane means for vertically supporting a manually removable canister and moving said canister among heating and vacuum drying positions;
- b. means for rotatably moving said carousel and supported canisters at least among said heating and vacuum drying positions;
- c. at least one canister for holding resin material being manually mountable on and removable from said carousel and being moved by carousel rotation at least among said heating and vacuum drying positions; and
- d. manually deactuable latching means for retaining a canister lowered into position on said carousel in locking engagement therewith.

24. The dryer of claim 23 wherein said carousel comprises:

- a. a first set of vertically elongated equi-angularly spaced blades; and
- b. a plurality of second sets of vertically elongated blades, connected to respective blades of said first set, with the blades of respective second sets and an associated connected blade of said first set being equi-angularly spaced.

25. A vacuum takeoff assembly for variable rate removal of dried granular resin material from a vacuum dryer, comprising:

- a. a downwardly extending granular material intake chute for receiving dried granular material;
- b. a granular material takeoff box connected to and positioned below said intake chute for receiving granular material flowing downwardly therein;
- c. a material takeoff tube rotatably slidably extending through an aperture in a wall of said takeoff box into the interior thereof, a portion of said tube within the

takeoff box interior having an axially elongated cutout in the tube wall, said cutout being defined by two straight edges parallel with the tube axis and two parallel arcuate edges formed along lines of circumference, said tube being positioned below said intake chute to receive downward flowing granular material in said takeoff box, a portion of said tube exterior of said takeoff box being adapted for connection to a vacuum line for draw of vacuum through said takeoff box to convey granular material out of said takeoff box and away from said dryer;

- d. a vacuum inlet connected to the interior of said takeoff box for supply of air thereto;
- e. a baffle in said takeoff box interposed between said air inlet and said takeoff tube cut out;
- f. said takeoff box having a side defined by a transparent sheet which is pivotally connected to said box for vertically swinging motion relative to said box to provide access to the box interior when swung away from said box; and
- g. said takeoff box having a closure member pivotally connected to said box on the same side as said transparent sheet and vertically displaced therefrom, for vertically swinging motion relative to said box to overlie said transparent sheet when said sheet is adjacent said box thereby precluding swinging motion of said transparent sheet away from said box and effectuating a seal at the proximate edge of said transparent sheet when in contact therewith.